time that the red is a *yellow* red, they become quite as distinct to the colour-blind as to the normal-eyed.

The colouring of geological maps is very perplexing to the colour-blind, and it is recommended that engraved marks, to distinguish the different strata, should always be added to the colours.

In conclusion, the author gives hints which he considers useful for the examination of colour-blind persons, and states the importance of collecting further evidence on the subject, of an accurate and definite nature.

II. "Researches on the Velocities of Currents of Air in Vertical Tubes, due to the presence of Aqueous Vapour in the Atmosphere." By W. D. CHOWNE, M.D. Communicated by JOHN BISHOP, Esq., F.R.S. Received May 22, 1856.

(Abstract.)

This was a paper supplementary to one presented June 14th, 1855, an abstract of which was published in the 'Proceedings of the Royal Society' for June 21st, 1855. The author having ascertained that an upward current of air becomes established in a vertical tube placed in as quiescent an atmosphere as can be obtained, and having demonstrated its existence by means of anemometric discs placed in tubes as described in that paper, proceeded to ascertain the velocity of the currents by which the discs were moved.

In order to estimate the velocity of the currents, one of the anemometric discs was placed within a short zinc tube three inches in diameter, the lower end of which was accurately fitted into an aspirator capable of containing thirty-six gallons of water. By drawing off in a given time a quantity of water equal in bulk to the cubic contents of one of the tubes described in the former paper, the velocity of a current required to produce a given number of rotations of the disc was determined.

The experiments were varied by altering the height of water in the aspirator, and thereby changing the velocity, while the exit-orifice remained unaltered.

By ascertaining the number of rotations of the anemometric disc,

caused by currents of air of different velocities thus produced, he was enabled to arrive at a measure of the velocities in tubes placed in a still atmosphere, as described in his former paper.

The author in that paper pointed out a correspondence between the variations of force in the upward currents of atmospheric air in the tubes and variations in the humidity of the atmosphere, and expressed his belief that the variations were attributable in great measure to the varying hygrometric conditions of the atmosphere.

In further proof of this position, he has appended two tables, showing that both natural and artificial increase of atmospheric humidity are accompanied by increase in the velocity of the rotations, and that in each case increase of humidity is attended by increase of velocity, independent of temperature.

III. "On the Thermal Effects of Fluids in Motion." By J. P. Joule, Esq., F.R.S., and Professor W. Thomson, F.R.S. Received May 23, 1856.

On the Temperature of Solids exposed to Currents of Air.

In examining the thermal effects experienced by air rushing through narrow passages, we have found, in various parts of the stream, very decided indications of a lowering of temperature (see Phil. Trans. June 1853), but never nearly so great as theoretical considerations at first led us to expect, in air forced by its own pressure into so rapid motion as it was in our experiments. The theoretical investigation is simply as follows:—Let P and V denote the pressure and the volume of a pound of the air moving very slowly up a wide pipe towards the narrow passage. Let p and v denote the pressure and the volume per pound in any part of the narrow passage, where the velocity is q. Let also $e-\mathrm{E}$ denote the difference of intrinsic energies of the air per pound in the two situations. Then the equation of mechanical effect is

$$\frac{q^2}{2g} = (\mathrm{PV}-pv)+(\mathrm{E}-e),$$

since the first member is the mechanical value of the motion, per